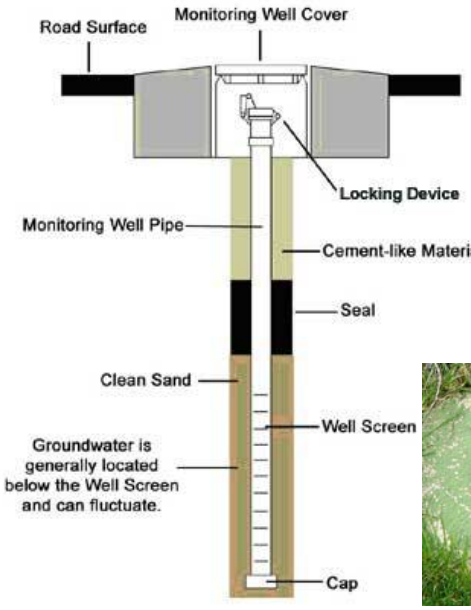
Geocoding Oregon Water Resources Department Well Logs
&
Exploring the Relationship between Surface Elevation and Depth to Groundwater

Data Sources

- Water Resources Department Well Logs
  http://apps.wrd.state.or.us/apps/gw/well_log/well_log.php
- ESRI Tiger File location:
  http://www.esri.com/data/download/census2000_tigerline/index.html
- Digital Elevation Map (NED) from:
  http://seamless.usgs.gov/website/seamless/viewer.php
- Counties, State Boundary, Geology:
  http://www.gis.state.or.us/data/alphalist.html
- Soils from:
  http://www.or.nrcs.usda.gov/pnw_soil/or_data.html

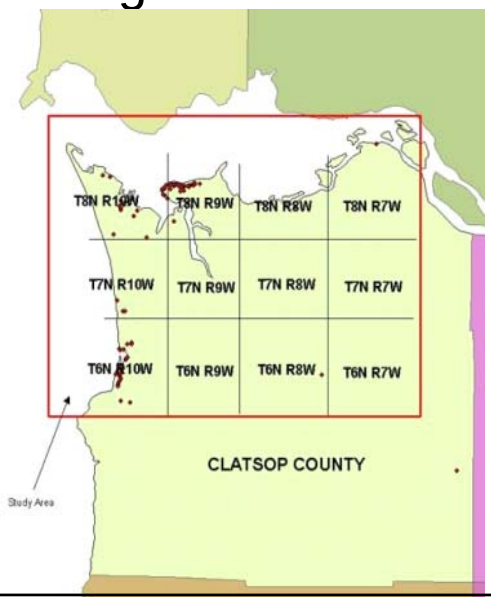
Location of Study Area

MONITORING WELL DIAGRAM

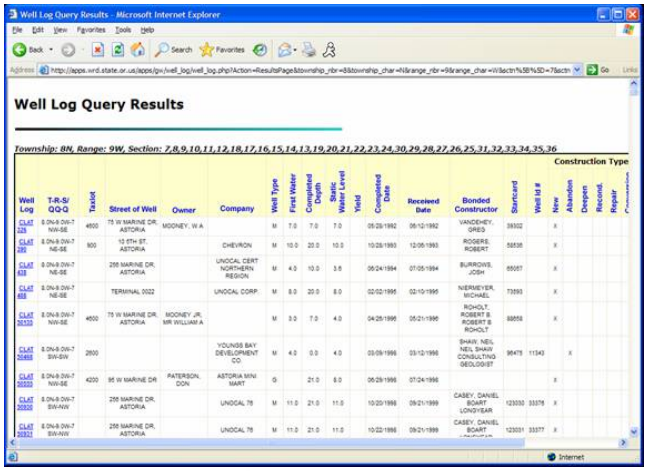


Oregon Water Resources Well Log Database Query

Well Logs and PLSS Grid



Results of WRD Query



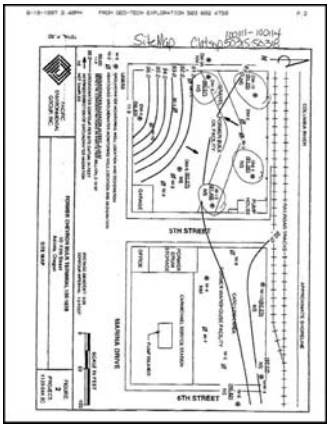
Well Log Query Results - Microsoft Internet Explorer

Well Log Query Results

Township: 8N, Range: 9W, Section: 7,8,9,10,11,12,18,17,16,15,14,13,19,20,21,22,23,24,30,29,28,27,26,25,31,32,33,34,35,36

Well Log	T-R-S/ QQ-Q	Taxlot	Street of Well	Owner	Company	Well Type	First Water	Completed Depth	Static Water Level	Yield	Completed Date	Received Date	Bonded Constructor	Startcard	Well Id #	Coestruction Type: New	Abandon	Deepen	Recond.	Repair
CLAT 126	8.0N-9.0W-7 NW-SE	4600	75 W MARINE DR, ASTORIA	MOONEY, W A		M	7.0	7.0	7.0		05/28/1992	06/12/1992	VANDEHEY, GREG	39302		X				
CLAT 280	8.0N-9.0W-7 NE-SE	900	10 6TH ST, ASTORIA		CHEVRON	M	10.0	20.0	10.0		10/28/1993	12/06/1993	ROGERS, ROBERT	58536		X				
CLAT 419	8.0N-9.0W-7 NE-SE		256 MARINE DR, ASTORIA		UNOCAL CERT NORTHERN REGION	M	4.0	10.0	3.6		05/24/1994	07/05/1994	BURROWS, JOSH	65057		X				
CLAT 466	8.0N-9.0W-7 NE-SE		TERMINAL 5022		UNOCAL CORP.	M	8.0	20.0	8.0		02/02/1995	02/10/1995	NIERMEYER, MICHAEL	73593		X				
CLAT 50133	8.0N-9.0W-7 NW-SE	4600	75 W MARINE DR, ASTORIA	MOONEY JR, MR WILLIAM A		M	3.0	7.0	4.0		04/25/1996	05/21/1996	ROHOLT, ROBERT B; ROBERT B ROHOLT	88659		X				
CLAT 50466	8.0N-9.0W-7 SW-SW	2800			YOUNGS BAY DEVELOPMENT CO.	M	4.0	8.0	4.0		03/09/1996	03/12/1996	SHAW, NEIL NEIL SHAW CONSULTING GEOLOGIST	96475	11343		X			
CLAT 50333	8.0N-9.0W-7 NW-SE	4200	95 W MARINE DR	PATERSON, DON	ASTORIA MINI MART	G		21.0	8.0		05/28/1996	07/24/1996				X				
CLAT 50926	8.0N-9.0W-7 SW-NW		256 MARINE DR, ASTORIA		UNOCAL 76	M	11.0	21.0	11.0		10/20/1998	09/21/1999	CASEY, DANIEL BOART LONGYEAR	123350	33376	X				
CLAT 50931	8.0N-9.0W-7 SW-NW		256 MARINE DR, ASTORIA		UNOCAL 76	M	11.0	21.0	11.0		10/22/1998	09/21/1999	CASEY, DANIEL BOART	123351	33377	X				

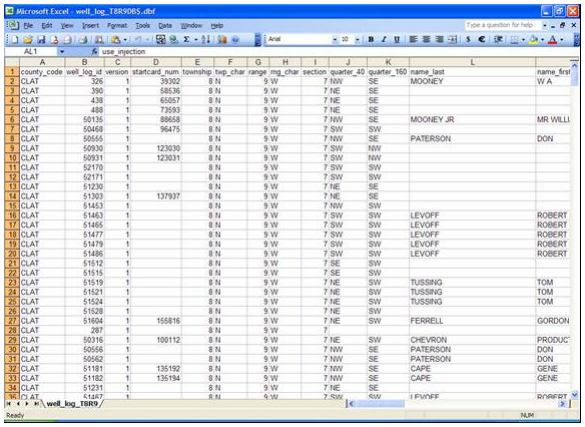
Well Logs



Problems with the Well Log Database

- Database is only searchable by Township and Range. Needs for larger datasets are cumbersome to fulfill.
- Wells are only located with address information, not geographic coordinates.
- Wells are not given elevation information – i.e., they are assumed to lie at the same elevation.
- Addresses are not updated, and many are out-of-date (some wells are 100+ years old).
- User is given a hyperlinked text file and the option to download a tab-delimitated file.
  - Locating wells within a given area is very time-consuming.

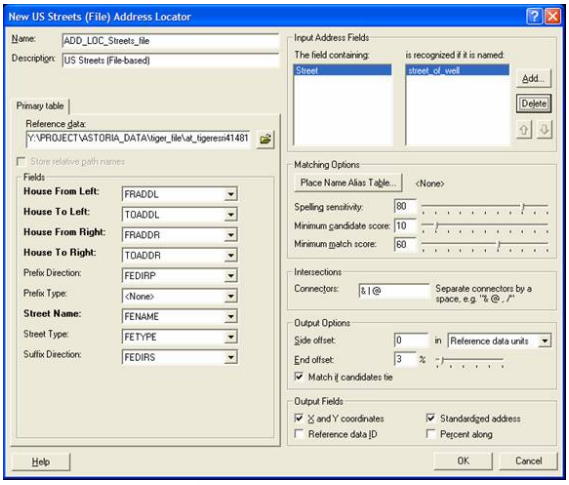
Open in MSEXCEL and save as DBF4



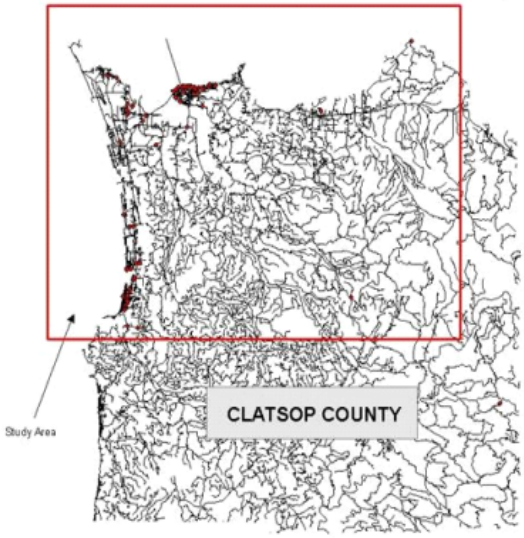
Well Log Statistics

- Started with 1402 well records from Water Resources.
- 404 records have Static Water Level Data recorded and non-zero.
- Correlation coefficient between surface elevation and Static Water Levels was calculated as 0.98 (Very High Correlation).

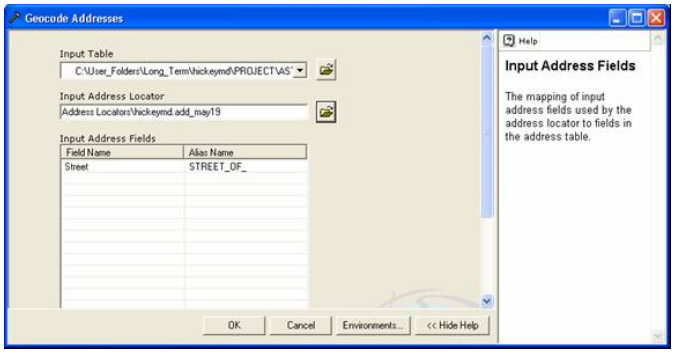
Creating an Address Locater



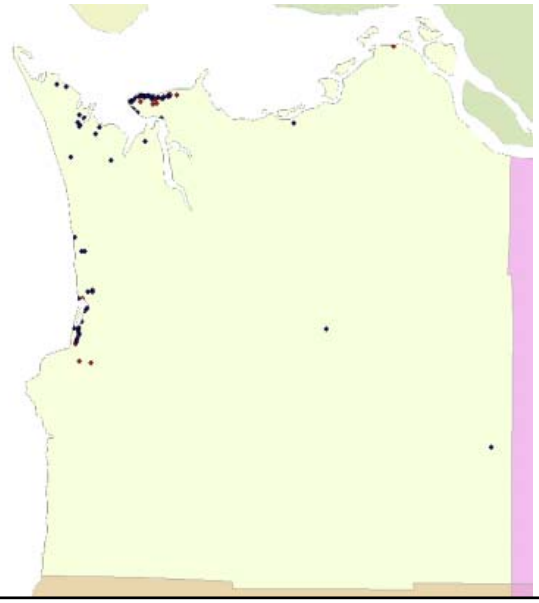
Well Logs and Tiger File



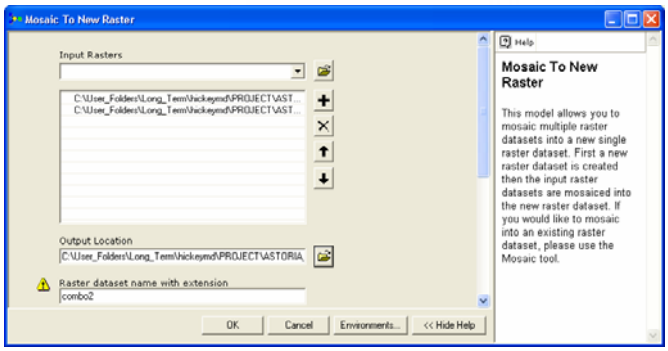
Geocoding Wells by Address



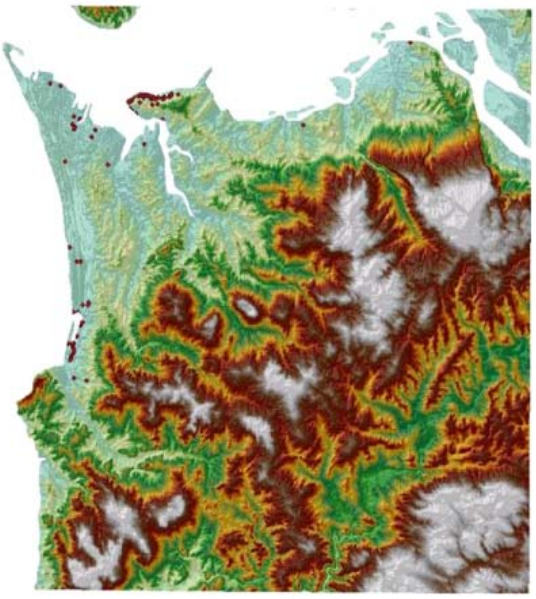
Geocoded Wells with non-zero Static Water Level Data



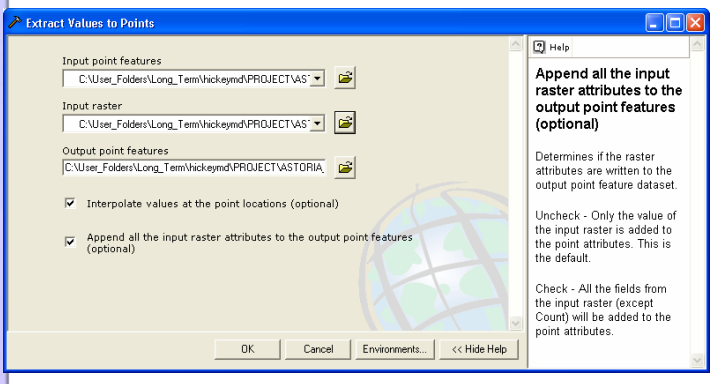
DEM File from USGS was in pieces and needed to be joined using the "Mosaic to New Raster Tool"



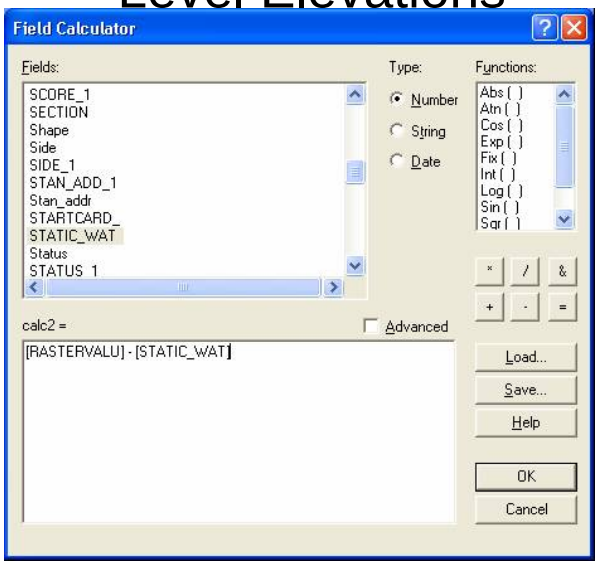
Geocoded Wells and Color-coded Elevation and Hillshade Map



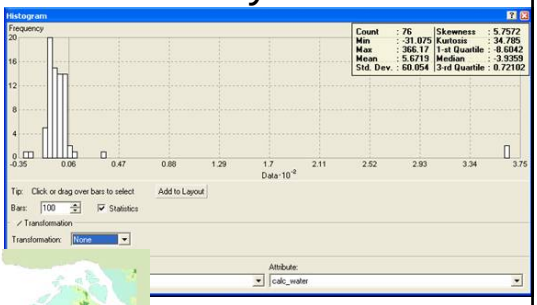
Used Extract “Values to Points” tool in ArcMAP Spatial Enalyst Toolbox to append Elevation data to each well

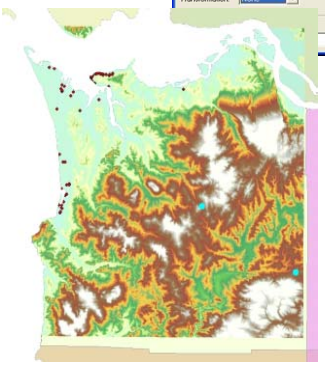


Calculation of Static Water Level Elevations



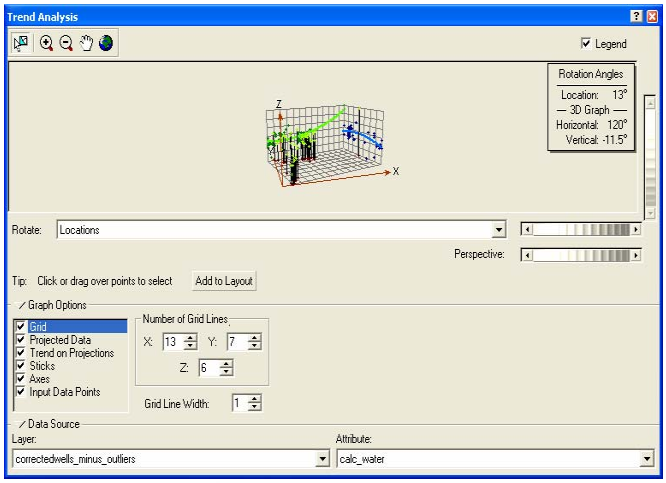
Explored Data using Geostatistical Analyst Tools

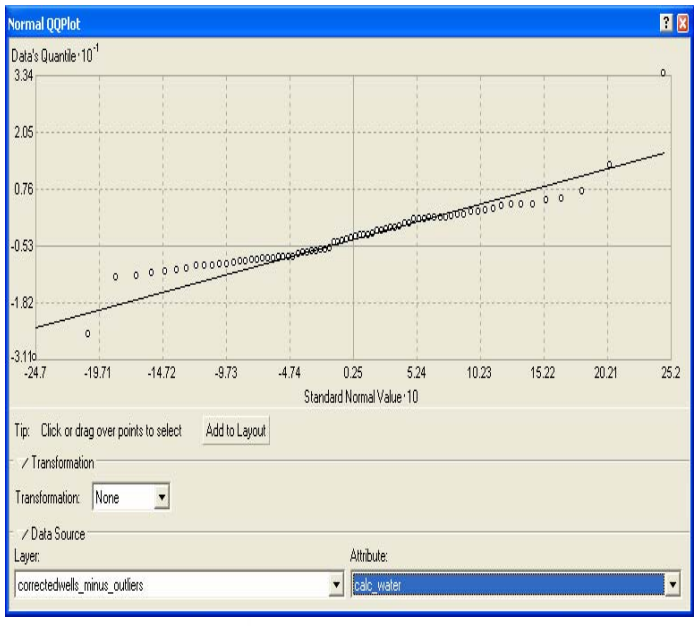




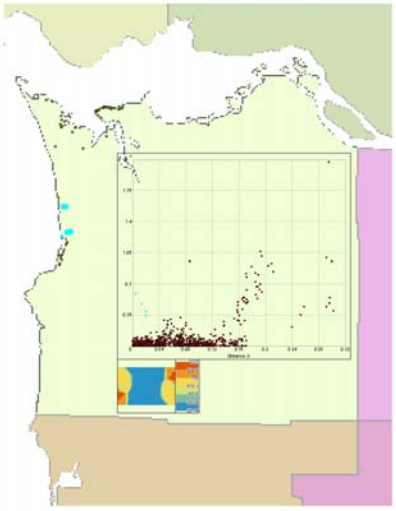
Deleted two outliers from dataset

Trend Analysis Shows Parabolic Trends both North/South and East/West

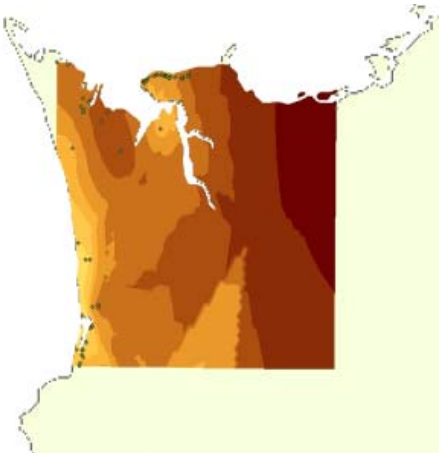




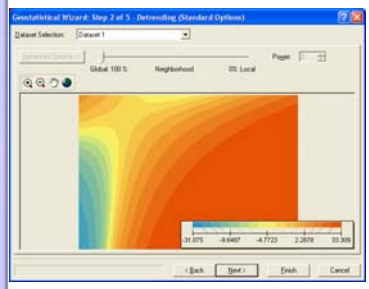
Variance between corrected static water level elevations for a few wells in near Seaside is high.

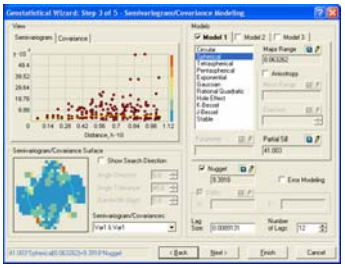


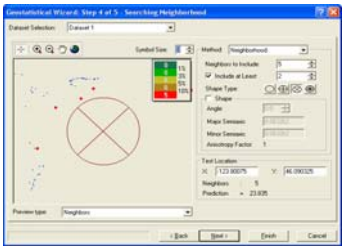
Ordinary Kriging



Kriging – Second order Trend Removal







Kriging with Second-Order Trend Removal